OPERATING INSTRUCTIONS

for

TYPE 1535-A CONTACTOR

CARNEL LABS CORPORATION

GENERAL RADIO COMPANY

CAMBRIDGE 39 MASSACHUSETTS

NEW YORK CHICAGO LOS ANGELES

U. S. A.

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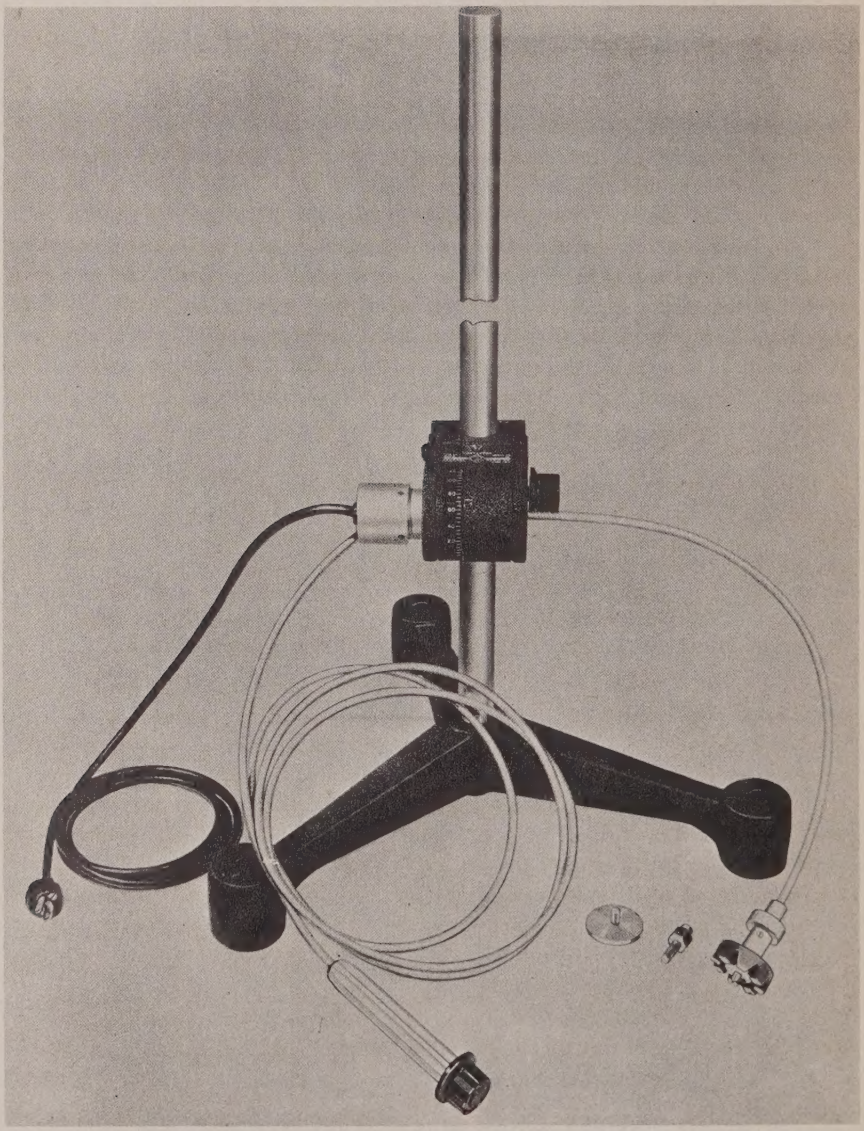


View of the Complete Type 1535-A Contactor with Auxiliary Coupling Devices Furnished as Accessories

Operating Instructions for Type 1535-A Contactor

Stroboscopic observations of moving mechanisms and machines often make it possible to adjust or correct actions without interrupting the operating cycle of the unit. Furthermore, the action of the machine can be seen while it is running at any desired speed. One of the simplest methods of controlling stroboscopic light is a contactor attached to one of the machine shafts. The Type 1535-A Contactor has been designed with a magnetic clutch so that it can be attached to any centered steel shaft one inch or greater in diameter quickly and easily without stopping the machine. Similarly, it is as easily and quickly removed. Simple auxiliary coupling devices are supplied for use on small shafts, non-magnetic shafts, or where it is desired to attach the contactor more permanently. This contactor is usable with both the Type 1532-B Strobolume and the Types 631-B and 631-BL Strobotacs.

SECTION 1.0 DESCRIPTION

The basic elements of the contactor are a rotating electrical contact and six fixed contacts spaced at equal angles around its periphery. Hence, combinations of one, two, three, or six equally spaced contacts per revolution can be used. Adjustment of the angular position of the contacts with respect to the rotating contact can be made over 360°. Relative position is indicated on a scale calibrated in 5° intervals. Two angular position controls are available for phasing; one at the end of an eight foot flexible cable, the other a knob mounted on the contactor body. The contactor assembly is mounted on a four-foot rod secured in a heavy cast base 18 inches in diameter. The height can be adjusted from six inches to four feet and thumb screws lock the assembly in position.

The rotor attaches to the shaft of a machine by a magnetic clutch or auxiliary coupling device at the end of an 18-inch flexible shaft.

SECTION 2.0 OPERATION

2.1 CONNECTIONS

If a shaft of the machine to which the contactor is being connected is steel, one inch or greater in diameter, and has been center-drilled, the magnetic

head can be attached or removed directly, even while the shaft is in motion. The magnetic head is merely held until the pointed center of the head is fitted into the shaft center and the magnet pushed into contact with the shaft. To remove the head, grasp the magnet, which will slip when restrained, and pull it smartly away from the shaft.

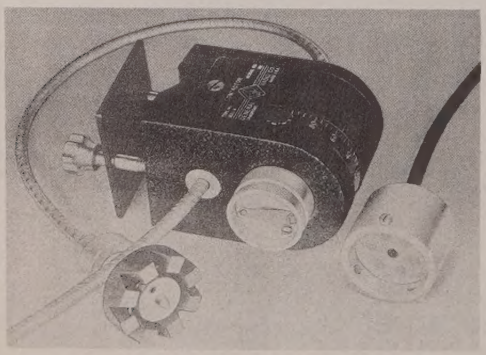
At higher speeds, particularly with sudden changes in shaft speed, left handed rotation looking at the shaft of the machine is recommended. This is to prevent the inertia of the heavy magnet from unscrewing the coupling.

CAUTION: The magnetic field near the magnet is sufficiently high to affect watches in the immediate vicinity.

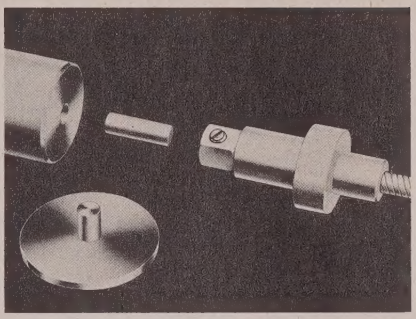
For small shafts or shafts of non-magnetic material, a Type 1535-P2 Adaptor Disc can be used. A ¼-inch hole must be drilled in the end of the shaft, into which the adaptor disc can be driven. The magnetic head is then attached to this disc as outlined above.

A Type 1535-P3 Plug can also be pressed into a ¼-inch hole about ½-inch deep and the Type 1535-P4 Coupling Adaptor attached to it. This arrangement is especially useful for more permanent installations. The coupling adaptor is interchangeable with the magnet, which can be unscrewed from the end of the flexible shaft after loosening the set screw in the face of the locking disc next to the magnet center. The magnet center and its spring are removed with the magnet.

The flexible shaft, running from the head to the contactor body, may be run out straight or bent through an angle up to 90°. The contactor head should be adjusted on the stand to about the same height as the driving shaft and short bends or kinks avoided. Improper alignment may loosen the magnet; when properly adjusted, the flexible shaft will run free without vibration. At speeds above about 2000 rpm, the driving cable and contactor assembly must be carefully aligned. If the magnet slips because of excessive machine vibration or a rough shaft end, direct connection should be used.



Close-up view of magnetic clutch and contactor head disassembled to show contact arrangement.



Close-up of alternative coupling devices. The steel disc in the foreground is the Type 1535-P2 Adaptor Disc for use with the magnetic clutch on nonmagnetic or small shafts. The small pin is the Type 1535-P3 Plug which is used with the Type 1535-P4 Coupling Adaptor shown attached to the flexible shaft at the right.

2.2 CONTROL OF STROBOSCOPE

When the Type 1532-B Strobolume is to be controlled, the plug on the end of the contactor cable is inserted directly in the receptacle on the rear of the Strobolume, and a slight right-hand twist will lock the plug. The INTENSITY switch on the Strobolume should then be set to the proper position and the power turned on. HIGH INTENSITY is used for maximum brilliance for limited periods and speeds up to about 1200 rpm. LOW INTENSITY may be used continuously at a reduction in brillance but at speeds up to about 3000 rpm. Further details are given in the instruction book for the Type 1532-B Strobolume.

When a Type 631-B or 631-BL Strobotac is to be controlled by the contactor, a Type 1535-P1 Adaptor Cable is needed. This cable is connected between the contactor cable and the receptacle in the rear of the Strobotac. The main-control switch of the Strobotac should be set to one of the CONTACTOR positions. With the Strobotac the voltage across the contacts is sufficiently high so that prolonged operation should be avoided to minimize contact wear. Observations at higher speeds should be made in as short a period of time as possible.

2.3 PHASING

The angular position of the flash with respect to the rotating shaft may be changed by the control knob on the contactor head or by the knob at the end of the 8-foot remote control cable. The position dial is graduated every 5° over the entire 360°. Thus, it is possible to note the reading and return either the contactor or the machine to the same position later, provided the magnetic head has not been disturbed. A locking screw is provided to lock the phasing control in any desired position.

Some end play is present in the remote-control cable to eliminate any binding as the position of the cable is changed. The phasing sleeve may be rotated several turns in either direction but the connecting cable is then wound up so that rotation should be reversed subsequently to prevent unnecessary twisting of the cable.

2.4 MULTIPLE FLASHES

In some applications, such as on some printing presses, it is desirable to have more than one flash for each revolution of the contactor shaft. The contact block of the Type 1535-A has six bronze contacts which may be connected to give 1, 2, 3, or 6 contacts per revolution. Special discs can be obtained on special order to give 4 or 5 contacts per revolution.

The contact head may be removed by loosening the two set screws and the disc will fall free if the head is then tapped lightly. The units are shipped with only the No. 1 contact wired to give a single flash per revolution. For two flashes, contact 4 should be connected to No. 1; and for three flashes, contacts 3 and 5 should be connected to No. 1. For six flashes per revolution, all of the contacts should be connected together. The small soldering lugs should be bent up to allow more room for soldering. The disc is then inserted in the head which is then pressed against the contactor body while the set screws are tightened.

2.5 PERMANENT MOUNTING

When a permanent mounting is desired, the entire unit can be removed from the stand. The clamp plate can be taken off and the two ¼ x 28 tapped holes in the casting used for mounting purposes, or the assembly can be clamped to any rod ¾" to 1 3/8" in diameter, such as a 1-inch pipe. The extension phasing shaft can be removed if not required. The shaft casing is released by a set screw on the under side of the casting, and the drive shaft itself is locked by a screw through the collar.

2.6 SPEED RANGES

The magnet drive shaft and contactor are both mounted in ball bearings and should run for long periods without attention or lubrication. For speeds up to about 1200 rpm the contactor may be run continuously. At speeds above about 2000 rpm it is recommended that the contactor be run only when necessary.

The contactor can be used at speeds up to 5000 rpm for short periods of time.

2.7 DOUBLE FLASHING

At low flashing speeds, double flashing may occasionally occur when the contactor is used with the Strobolume or Strobotac. This is caused by some slight leakage or by a triggering of the stroboscope on both the make and break of the contact. This condition is usually not troublesome and, if necessary, it can be eliminated by inserting a simple Resistance-capacitance filter in the contactor leads. (See also Paragraph 3.1)

MAINTENANCE

3.1 CONTACTS

The continuous friction of the rotating brush carries over small metal particles which should be removed occasionally. Usually, simply wiping the contacts with a dry cloth will be found sufficient; but if necessary crocus cloth can also be used first. The arcing caused by breaking the electrical circuit also produces some wear, principally at the leading edge of the contacts, and the same cleaning procedure should be used for this condition. When only one contact is used, it is possible to transfer the lead to another unused contact to distribute the wear evenly.

Dirty or worn contacts will sometimes produce a slight unsteadiness or skipping in the flashing as well as double flashing. The intervals between cleaning can best be determined by experience but should not be too frequent.

The movable silver contact requires little attention but should be kept polished.

3.2 BEARINGS

The main operating bearings are ball bearings lubricated for life and require no attention. The bearings in the phasing control shaft should also require no attention since they are used at only slow speeds and are factory adjusted.

3.3 FLEXIBLE SHAFTS

Both flexible shafts are inside-greased and except under conditions of almost continuous operation for a year, should require no further lubrication. At very high speeds, some lubricant may work out through the outer casing of the short flexible shaft but need be replaced only after continuous re-occurance. To lubricate the short shaft, it should be removed from the outer casing by loosening the set-screw collar inside the main contactor assembly. A light grease should be placed over the entire length of the shaft, which is then slid back through the casing.

3.4 MAGNET

The magnet used should have a very long life, but if necessary, can be replaced.

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